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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/540,400	03/31/2000	Frans Lodewijk Plantenga	ACH2696	2198

7590 06/03/2004

Louis A Morris  
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EXAMINER

GRIFFIN, WALTER DEAN

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 06/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/540,400

Applicant(s)

PLANTENGA ET AL.

Examiner

Walter D. Griffin

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 19 April 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION*****Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 19, 2004 has been entered.

***Claim Objections***

The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claim 9 has been renumbered as 10. Claim 9 was previously canceled in the amendment filed on May 12, 2003. Therefore, the claim numbered as "claim 9" in the amendment of April 19, 2004 is misnumbered and should apparently have been presented as new claim 10.

Claim 10 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the

Art Unit: 1764

claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 10 does not further limit claim 8 with respect to the second catalyst because the second catalyst metals in claim 10 are already contained in claim 8.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamo et al. (US 5,162,281).

Art Unit: 1764

Applicants are claiming a process for reducing the sulfur content of a hydrocarbon feedstock to a value less than 200 ppm. Applicants' process comprises contacting the feed with a catalyst comprising a Group VIII metal, a Group VIB metal, and an organic additive on a carrier. The dependent claims define specific organic additives.

The Kamo reference discloses a process for deep desulfurization of hydrocarbons. Since deep desulfurization is disclosed, alkylated benzothiophenes will be removed in the process. The process uses a catalyst that comprises a Group VI metal such as molybdenum and a Group VIII metal such as nickel on a carrier. The catalyst also contains an organic compound. The catalyst is also sulfided by the addition of an organic sulfur compound to the catalyst. This would necessarily occur in the reaction zone. The desulfurization process comprises contacting the feed with the catalyst at elevated temperature and pressure. The feed used in the examples has a 95% boiling point of less than 450°C. See column 2, lines 31-36 and 46-68; Column 3, line 1 through column 4, line 40; column 4, lines 59-64; and the examples.

The Kamo reference does not disclose that the feed has a sulfur content of less than 500 ppm and does not disclose the claimed sulfur contents of the product.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to treat any sulfur containing feed, including a feed with the specific boiling point and sulfur content claimed by applicants, by the process of Kamo because it does not limit the specific types of sulfur containing oils. One of ordinary skill in the art would be motivated to treat any oil with an undesirable level of sulfur according to the process of Kamo including a feed with the sulfur contents in applicants' claims, since it is known to be effective for removing

Art Unit: 1764

undesirable sulfur. Treatment of applicants' specific oil with specific starting sulfur amounts would yield a product with a sulfur content as defined in applicants' claims.

Claims 1-5, 7, 8, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi et al. (US 5,468,709).

The reference of Yamaguchi discloses a catalyst suitable for desulfurizing a hydrocarbon feed containing sulfur. See column 47, lines 45-55. The catalyst comprises a Group VIII metal (nickel or cobalt), a Group VIB metal (molybdenum), an additive, and a support. See column 4, lines 1-15 and 45-62. The reference teaches that suitable additives include ethylene glycol or a polysaccharide. See column 4, lines 50-54 and column 6, lines 12-24. Yamaguchi also discloses that the catalyst can be presulfided *in situ*. See column 9, lines 55-65.

The Yamaguchi reference succeeds in teaching the use of a catalyst for desulfurization of an oil with components corresponding to those claimed by applicants.

Several differences are noted between the reference of Yamaguchi and the claims. It is noted that the reference is silent about limiting the feed boiling point and sulfur content and does not disclose the reduction of alkylated benzothiophenes.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to treat any sulfur containing feed, including a feed with the specific boiling point and sulfur content claimed by applicants, by the process of Yamaguchi because it does not limit the specific types of sulfur containing oils. One of ordinary skill would be motivated to treat any oil with an undesirable level of sulfur according to the process of Yamaguchi including a feed with the sulfur contents in applicants' claims, since it is known to be effective for

Art Unit: 1764

removing undesirable sulfur. Treatment of applicants' specific oil with specific starting sulfur amounts would yield a product with a sulfur content as defined in applicants' claims.

Regarding the reduction of alkylated benzothiophenes, one having ordinary skill in the art would have been motivated to use the catalyst of Yamaguchi to reduce the amount of these types of sulfur compounds because the catalyst has higher activity than conventional catalysts.

In addition, it is noted that the reference is silent about a second desulfurization step as defined in applicants' claim 8. However, applicants' second desulfurization step is considered to be a repetition of the first desulfurization of the first. It would have been obvious to one of ordinary skill in the art at the time the invention was made to repeat the desulfurization step of Yamaguchi because it is within the level of ordinary skill in the art to repeat a known processing step until a desired sulfur removal level is obtained.

Claims 1-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0870817A1 in view of Yamaguchi et al. (US 5,468,709).

The EP reference discloses a two-stage desulfurization process for a hydrocarbon feedstock with a 95% boiling point of 450°C or less. See abstract, column 1, line 4. The catalyst comprises Group VI and VIII metals (e.g., nickel, cobalt, molybdenum). See page 2, lines 6-8 and 45-50. The catalyst can be employed in sulfided form (can be sulfided in situ). See page 2, lines 55-60. The process can involve two hydrogenation steps. See abstract, column 2, paragraph 2. The final product comprises less than 350 ppm sulfur.

The EP reference succeeds in disclosing a desulfurization process with steps, a feed, and Group VI/VIII catalyst sulfided catalyst corresponding to those claimed by applicants.

Art Unit: 1764

A difference is noted between the EP process and applicants' claimed process. The reference does not disclose the use of applicants' claimed additives or the removal of the claimed alkylated benzothiophenes.

The Yamaguchi reference is cited for the general teaching that applicants' claimed additives are known to increase the activity of Group VI/VIII desulfurization catalysts. See abstract and column 6, lines 10-45.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the Group VI/VIII catalyst of the EP reference to include the additives defined in applicants' present claims because the Yamaguchi reference illustrates that such additives are known to increase the activity of Group VI/VIII desulfurization catalysts. One of ordinary skill in the art desiring increased desulfurization would be motivated to include applicants' additives.

Regarding the reduction of alkylated benzothiophenes, one having ordinary skill in the art would have been motivated to use the catalyst of Yamaguchi in the EP process to reduce the amount of these types of sulfur compounds because the catalyst has higher activity than conventional catalysts.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).



Art Unit: 1764

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 2, 6, and 7 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 11, 12, and 16 of U.S. Patent No. 6,540,908. Although the conflicting claims are not identical, they are not patentably distinct from each other because each set of claims is drawn to a hydrotreating process in which the feed is contacted with a catalyst that contains hydrogenation metals and an organic additive.

The patented claims do not include the feed boiling point and sulfur content and do not include the reduction of alkylated benzothiophenes.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to treat any sulfur containing feed, including a feed with the specific boiling point and sulfur content and compounds claimed by applicants, in the patented process because the patented claims do not limit the specific types of sulfur containing oils. One of ordinary skill would be motivated to treat any oil with an undesirable level of sulfur according to the patented process including a feed with the sulfur contents in applicants' claims, since the patented claims are effective for removing undesirable sulfur. Treatment of applicants' specific oil with specific starting sulfur amounts would yield a product with a sulfur content as defined in applicants' claims.

Claims 1, 2, 7, 8, and 10 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 7-12, and 18-28 of

Art Unit: 1764

copending Application No. 09/942830. Although the conflicting claims are not identical, they are not patentably distinct from each other because each set of claims is drawn to a process for reducing sulfur in a hydrocarbon by contacting the hydrocarbon with a catalyst that contains an organic additive. The claims in 09/942830 contain a specific organic compound. However, a species anticipates the claimed generic organic additive of the present claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### *Response to Arguments*

The argument that Yamaguchi teaches away from the use of nickel in the catalyst is not persuasive. Although Yamaguchi discloses that catalysts using cobalt exhibit high activity for desulfurization, Yamaguchi does not exclude the use of nickel in these catalysts. Yamaguchi discloses in column 4, lines 66 and 67 that the catalyst contains at least one group VIII metal. Therefore, Yamaguchi envisions the combination of nickel and cobalt with such a catalyst being expected to be effective for desulfurization. Also, it is noted that the present claims do not exclude the presence of additional metals in the catalyst.

The argument that a skilled person would read the Yamaguchi reference in the context of its background and would recognize that the reference relates to catalysts suitable for effecting conventional HDS because this was the only HDS process known at the time is not persuasive. Nowhere does Yamaguchi disclose that the catalyst is effective only for conventional HDS processes. In fact, Yamaguchi discloses in column 1, lines 38-42 that it has been noticed that the conventionally prepared catalysts cannot satisfactorily meet an ever growing demand on

Art Unit: 1764

reducing the levels of sulfur and nitrogen compounds in the heavy oils or the like. Therefore, Yamaguchi does not consider the disclosed catalysts to be conventional and suggests that deeper desulfurization and denitrogenation can be achieved through the use of the catalyst in a hydrotreating process. Because it appears as if the Yamaguchi process is not drawn to a conventional HDS, the Platenga declaration filed on November 13, 2003 is also not persuasive. It is certainly not clear that the claimed ultra-deep HDS is any different from the HDS disclosed by Yamaguchi.

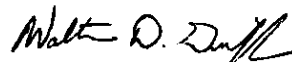
### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter D. Griffin whose telephone number is (571) 272-1447. The examiner can normally be reached on Monday-Friday 6:30 to 4:00 with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1764

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Walter D. Griffin  
Primary Examiner  
Art Unit 1764

WG

May 28, 2004